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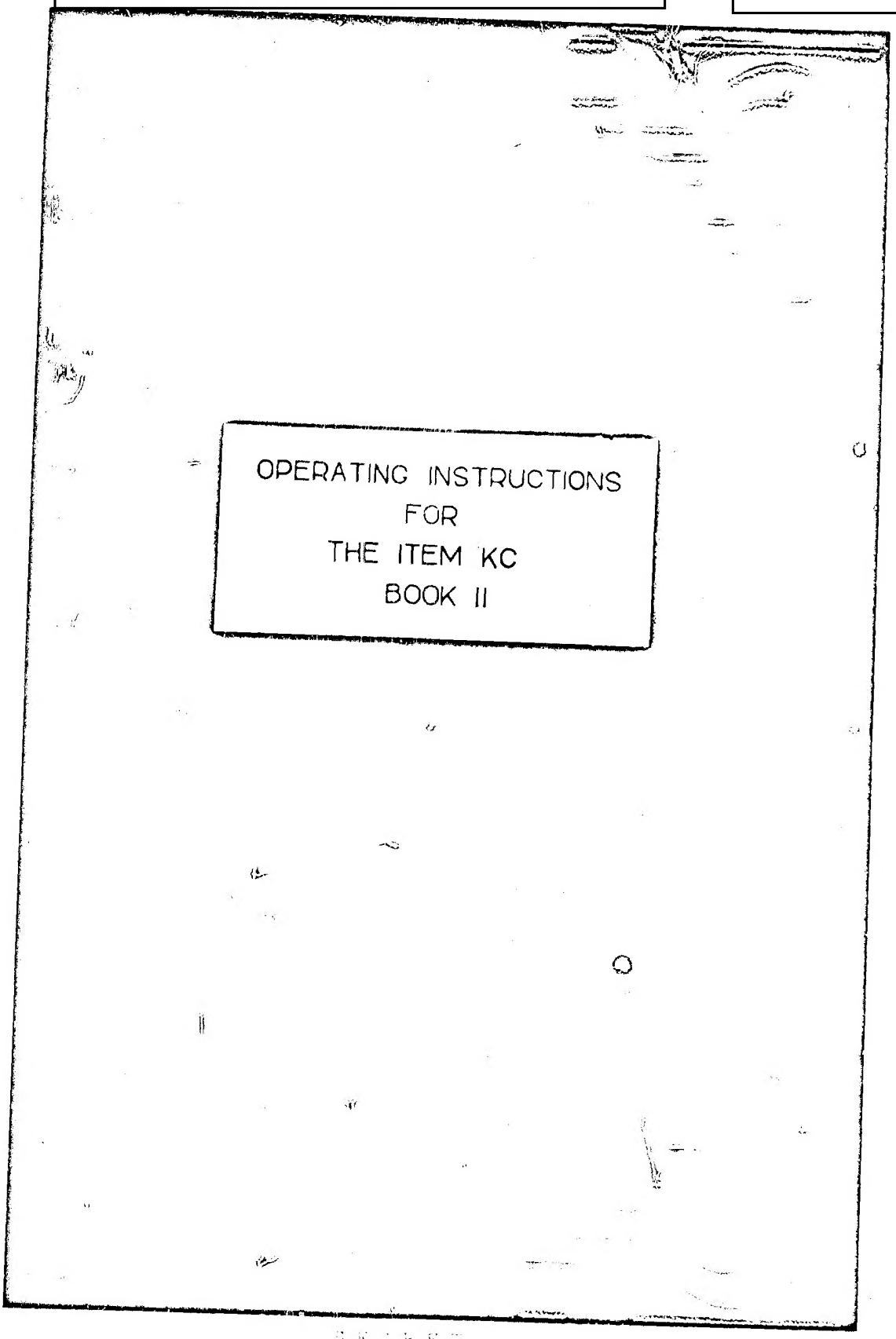
TU-16

OPERATING INSTRUCTIONS FOR

THE ITEM KS

Book II



OPERATING INSTRUCTIONS
FOR
THE ITEM KC
BOOK II

Attachment No. 5 to

Secret

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OPERATING INSTRUCTIONS

FOR

THE "KC" WINGED MISSILE

(Supplement to book I)

B O O K II

The Operating Instructions for the "KC" winged missile consist of two books:

Book I - Operating Instructions for the "KC" winged missile (restricted).

Book II - Operating Instructions for the "KC" winged missile (secret).

The Operating Instructions for the "KC" winged missile are intended for the mechanical personnel servicing the "KC" winged missile.

C O N T E N T S

S E C T I O N I

PRE-FLIGHT PREPARATION OF THE MISSILE

S E C T I O N II

"KC" MISSILE MAINTENANCE AFTER LANDING

(Supplement to Section IX, Book I)

S E C T I O N III

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(Supplement to Section VII, Book I)

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Page

S E C T I O N IV

GROUND EQUIPMENT. DESCRIPTION, PURPOSE AND OPERATING INSTRUCTIONS.

(Supplement to Section A, para.2, Book I).

L I S T

of Illustrations given in this Book

S E C T I O N I

PRE-FLIGHT PREPARATION OF THE MISSILE

I. GENERAL

1. When preparing the "KC" missile before a flight proceed as follows:

1. Fill the missile with fuel and oil.

2. Install the " 4T-52" warhead in the warhead compartment of the "KC" missile.

NOTE: The weight of the " 4T-52" warhead fully loaded must be 1015^{+17}_{-13} kg.

3. Attach the "KC" missile to the carrier-aircraft and properly level the missile.

4. Test the "KC" missile engine by controlling it from the carrier-aircraft.

5. Check the "KC" missile electrical and special equipment from the carrier-aircraft.

6. Install the tracer, fuses and connect the cables to the fuse triggering pins.

7. Pre-flight inspection of the missile.

To prepare the missile before a flight tow it to the servicing site, remove the seals and fill with fuel and oil. Fill 245^{-5} litres of fuel.

Tow the "KC" missile to the warhead loading site to install the " 4T-52" warhead into the "KC" missile warhead compartment.

Install the "[illegible]" warhead in conformity with para.4, this Section.

After installing the "[illegible]" warhead tow the "KS" missile to the carrier-aircraft parking place. Remove plugs from the PK-63 plug connector and the fuel system valve. Remove the access door panel from the warhead compartment.

Attach and properly level the "KS" missile.

The detailed description of the "KS" missile attachment and levelling to the TY-[illegible]KS carrier-aircraft is given in the "Maintenance Instructions for the TY-[illegible] carrier-aircraft auxiliary equipment". Listed below are the operations required for attaching the "KS" missile to the carrier-aircraft rack.

Connect the PK-63 plug connector: to do this:

1. Using the wrench extend the PK-63 plug connector, manually straighten the rod so that the PK-63 plug connector keys coincide with the receptacle key slots on the "KS" missile.

Then smoothly lower the plug till it contacts the receptacle pins. Slightly shake the plug so that all the pins would enter the sockets and only after that fully lower the plug.

2. Unlock the wrench ratchet without removing the hand from the wrench handle: after that turn the wrench to lift the PK-63 plug connector till the red mark on the indicator coincides with the edge of the rod nut. In this position lock the wrench ratchet.Using the wrench extend the quick-disconnect fuel supply pipe of the TY-[illegible]carrier-aircraft through which the carrier-aircraft fuel is supplied to the "KS" missile fuel system. When extending the pipe direct manually the valve stem into the socket in the "KS" missile.

Lower the fuel supply pipe onto the "KC" missile external fuel supply valve and keep it so till the indicator rod marks on the valve and external fuel supply pipe casing are aligned.

Test the "KC" missile engine, electrical and special equipment by operating them from the carrier-aircraft in accordance with the " Maintenance Instructions for the TY-16KC carrier--aircraft auxiliary equipment", Instructions for the TY-16KC carrier-aircraft crew operation with the "K" equipment on the ground and in the air" and para.2 and 3, this Section.

After checking the "KC" missile, check the quantity of oil in the oil tank using the bayonet gauge; if necessary, fill the tank up to the level of 6-8 litres; check the fuel quantity in the aircraft fuel tank by using the bayonet gauge and, if necessary, fill the tank up to the level of 245 litres(200 kg.).

It is permitted to replace the ПШр4 fuse in the АУ-4I motor power supply circuit of the K1-7M unit with a jumper; to do this:

a) open the lower access door between frames 5 and 6;

b) unscrew the attaching screws and open the K1-13M unit fuse box cover;

c) replace the ПШр4 fuse with the jumper provided in the set of spare parts, tools and devices (1:1).

Close the access doors, install the K-403A fuses.

Connect the cables to the fuse triggering pins (see para.4, this Section and "Operating instructions for the K-403A fuse"

NOTE: The cables must be installed and connected by the armament specialists.

The condition of the "KC" missile, after the pre-flight

preparation procedure is completed, corresponds to a state of readiness No.1 for the whole weapon system ([illegible] carrier-aircraft together with the "KC" missile).

The "KC" missile is permitted to be kept in the condition of readiness No.1 for one flying day.

Immediately before taking-off inspect the "KC" missile and proceed as follows:

a) check the air intake ducts for freedom from foreign objects;

b) inspect the left wing and aileron; when pressing the aileron manually it must freely, without sticking, deflect up and down;

c) inspect the tail unit; deflect the elevator and rudder pressing them with the hand; they must deflect freely without sticking;

d) make sure that the engine extension pipe is free from foreign objects;

e) inspect the right wing and aileron;

f) make sure that all the missile access doors are closed;

g) inspect the missile suspension rack, shackle, PK-63 connector and fuel supply connection; make sure that the [illegible] are connected to the triggering pins of the fuses.

h) remove the safety pin from the rack shackles;

i) make sure that the servicing site is free from foreign objects (ladder, stands, etc.).

If a combat is not made within the flying day, the "KC" missile can be remained attached to the carrier-aircraft rack.

In this case remove the K-403A fuses from the " 4T-52" warhead, place the cart under the "KC" missile (for safety) and cover the "KC" missile with the tarpaulin cover. Such a condition of the missile corresponds to a state of readiness No.2.

The "KC" missile is permitted to be attached to the TY-16KC carrier-aircraft rack (readiness No.1 and No.2) for not more than 3 days since the moment of attachment.

If this term is exceeded detach the "KC" missile from the carrier-aircraft rack, remove the " 4T-52" warhead from the missile and perform the pre-flight inspection of the "KC" missile; after that the condition of the missile corresponds to state of readiness No.3.

To use the "KC" missile, being in readiness No.2 condition remove cover from it, and perform the combined checkout of the missile and " TY-16KC " carrier-aircraft, install the K-403A fuses, connect the cables to the fuse triggering pins and perform the pre-flight inspection of the missile.

WORK: If the preparation of the missile in the take-off position is carried out before the missile corresponds to readiness No.2 do not check the "KC" missile and TY-16KC carrier-aircraft or install the K-403A fuses.

2. ENGINE PRE-FLIGHT TEST

Perform the engine pre-flight test immediately prior to the take-off.

When preparing the engine observe the instructions given in the subsections "Preparation of the Engine for Operation", Section II and "Engine Pre-flight Inspection", Section V, Book " PK-300K Engine Operating Instructions and Description". Given below is the list of operations to be performed during the preparation of the engine before a flight. When performing every operation, consider the notes given in para. "General Information for this Section".

1. Before attaching the "KC" missile to the carrier-aircraft fill the "KC" missile with fuel and oil. After filling, the quantity of fuel in the tank must be 245 litres and the quantity of oil - 6-8 litres checked by the bayonet gauges.

2. After attaching the "KC" missile to the carrier-aircraft and connecting the PK-63 plug connector and fuel supply connection from the carrier-aircraft, switch on the A3C-5 circuit breaker "SYSTEM SUPPLY" on the bombardier panel and check the engine control system and fuel supply system for proper functioning:

a) check that, with the engine throttle valve and cut-off valve set in the extreme position, the corresponding warning lights become illuminated on the aircraft engines starting and control panel at the co-pilot's station;

b) open the shut-off valve and switch on the ЭЦН-45ТК fuel booster pump of the carrier-aircraft from the aircraft engines starting and control panel at the co-pilot's station. Observing the reading of the pressure gauge on the co-pilot's central instrument panel check the pressure which should be within 1.8÷2.0 kg/cm^2 at a voltage of 27.5÷0.5 V.

Operating the pump for 1-2 minutes check the fuel supply connection on the carrier-aircraft-to-"KC" missile attachment rack for freedom from leakage. After that start the NHB-2 pump, stop the NH-45TK pump and close the aircraft fuel shut-off valve. Check the NHB-2 pump operation by ear.

The NHB-2 pump is started when a voltage is supplied to the "K" bus-bar, through the closed "KI and AP" switch on the bombardier's control panel.

WARNING: Before energizing the "KC" missile bus-bar check that the special equipment is switched off (the switches on the K1-13 and I-1 units must be set in the "OFF" position. Test the engine only with the special equipment de-energized.

3. To prepare the engine for starting:

a) remove the shields from the air intake and jet nozzle, check that the plugs and seals are removed from the fuel tank vent and cooling air pipes; remove the clamp from the aileron;

b) make sure that the fuel system shut-off valve is locked in the open position;

c) check that the cap is removed from the CД-3 pressure switch connection and the plugs are removed from the БР-I barometric pressure control;

d) inspect the engine and engine compartment through the starboard access door;

e) make sure that the engine air intake ducts and extension are free from foreign objects;

ignition

4. Check the flight start system: to do this, set the "GROUND START - BLOWING -FLIGHT START" selector switch on the engine starting and control panel in the "FLIGHT START" position and the "IGNITION" A3C-30 circuit breaker in the "ON" position for 1-2 sec.

In this case two flames of fire (in combustion chambers No.03 and 8) must be seen.

Observe the flames at a distance of 3-4 m. from the extension pipe jet nozzle end.

5. Start the engine.

NOTE: Start the engine and check its operation by using the fuel supplied from the carrier-aircraft. In this case the fuel quantity in the "XC" missile tank should remain unchanged.

Start the engine as follows:

a) before starting the engine observe the reading of the voltmeter (on the pilots' central instrument panel) to check the voltage of the carrier-aircraft electrical system, which must be 27.5±0.5 V.

b) set the "SHUT-OFF VALVE" selector switch on the engine starting and control panel in the "OPEN" position and the pump control rheostat - in the "DECREASE" position.

c) in the carrier-aircraft switch on the power supply for the missile; set the "MISSILE POWER" A3C-5 circuit breaker and "K-1 and [redacted]" selector switch in the "ON" position, in this case the "OIL PRESSURE" warning lights on the pilots' central instrument panel and the "CUT-OFF VALVE CLOSED" and "LOW SPEED" warning lights on the engines starting and control panel at the co-pilot's station must become illuminated;

d) set the "FLIGHT START - BLOCKING - GROUND START" selector switch in the "GROUND START" position;

e) set the "IGNITION" AZC-30 circuit breaker in the "ON" position;

f) open the cut-off valve and press the starting button for 1-2 sec.; in this case the "IGNITION" warning light must come on.

After that the engine must be automatically started and attain the low speed rating (3500^{+100}_{-200} r.p.m.).

When the engine begins running at the low speed, the " OIL PRESSURE" warning light on the pilots' central instrument panel must go out;

g) after the engine has attained the low speed, set the "IGNITION" AZC-30 circuit breaker in the "OFF" position.

6. Check the engine operation.

Check the "KC" missile engine operation from the carrier-aircraft according to the diagram given in Fig.40.

NOTE: With the engine running inspect the connections for freedom from leakage and damages through the starboard access door.

Smoothly change the engine rating from the low speed to maximum speed (within 3 min.). With increase in the engine r.p.m. check the "KC" missile generator switching on by observing the voltmeter on the pilots' central instrument panel.

The voltage should be 28±0.5 V.

WARNING: Do not switch off the external power supply as an interlocking relay is provided in the carrier-aircraft electrical system.

After operating the engine at the maximum speed for 1 min. stop the IIH-45TK pump for 3-5 sec. and close the carrier-aircraft fuel system shut-off valve.

When changing the missile engine fuel supply to drawn fuel from the "KC" missile fuel tank or from the carrier-aircraft fuel system, permissible change in the engine speed is ± 50 r.p.m.

NOTE: When changing the engine fuel supply to drawn from the "KC" missile tank for 3-5 sec. fuel consumption is 4-5 litres.

Stop the engine as follows:

a). switch off the IIH-45TK pump;

b). close the shut-off valve;

c). close the cut-off valve.

After the engine turbine is stopped set the "MISSILE POWER" A3C-5 circuit breaker and "K-I and AP" selector switch in the "OFF" position.

7. Check the fuel and oil level in the respective tanks by using the bayonet gauges. If necessary, fill the fuel tank up to the level of 245 litres and the oil tank to the level of 6-8 litres.

8. Connect the special equipment.

9. Close all the access doors.

10. Transfer the missile for performing further preparatory operations.

3. ELECTRICAL AND SPECIAL EQUIPMENT PRE-FLIGHT TEST

The equipment is prepared for operation before a flight when the "KC" missile is attached to the carrier-aircraft.

Prepare the electrical and special equipment before the flight as follows:

1. Check the remote-control operation of the engine throttle valve and cut-off valve actuators observing the warning lights on the engine-starting and control panel at the co-pilot's station.

2. Check the operation of the oil pressure switch and MT-6П tachometer transmitter by observing the "ОСЬ РЕГУЛЯТОР" warning light and tachometer indicator on the pilots' central instrument panel (when testing the engine).

3. Check the generator operation and moment when the generator gets connected to the electrical system by observing the voltmeter and tachometer indicator installed on the pilots' central instrument panel (when testing the engine from the carrier-aircraft).

The generator should be connected to the missile electrical system at the engine speed of 5500-6500 r.p.m.

4. Check the СИКС-1А unit operation in accordance with the "Description and Operating Instructions "ТА 802-0-00 ТО and ИЭ

5. Test the К1-М station and АПК-5В autopilot for proper functioning according to the "Temporary Operating Instructions for the К1-М station" and " АПК-5В Autopilot Operating Instructions".

6. Install the ТК-60 tracer on the "KC" missile and connect electrical wires to the tracer.

NOTE: If the "KC" missile was not used within 3 days since attached to the carrier-aircraft it is necessary to remove the missile. Check the equipment according to the instructions given in the "KC" Missile Operating Instructions, Section VII, Book I.

4. PREPARING THE WARHEAD FOR USE

GENERAL

Outlined in this section are the main procedures performed during preparation of the "KC" missile warhead for use.

The detailed description of all the procedures is given in the "4T-52 Warhead Description and Operating Instructions", "V-403A Fuse Operating Instructions"; "Instructions for Preparation and Installation of the 4T-52KC Warhead and V-403A Fuses in the "KC" Missile Warhead Compartment".

Before delivering the 4T-52 warhead to the loading site of the airfield, store it in the box in a depot of the using organization located at a distance of not less than 3 km. from dwelling houses and air field.

Transport the 4T-52 warhead packed from the depot to the loading site by trucks having the load-carrying capacity of not less than 2 t. at a speed not exceeding 20 km/hr.

Do not keep on the loading site at a time more than eight 4T-52 warheads loaded incompletely.

PREPARATION OF THE WARHEAD FOR USE

On the loading site unpack and deprecerve the 4Г-52 warhead and install it in the "КС" missile warhead compartment. To install the 4Г-52 warhead in the "КС" missile, lift the warhead by the truck crane or some other lifting device having the load carrying capacity of not less than 2000 kg. which ensures safety operations with high explosive.

The missile must be installed on an airfield cart in the horizontal position. Secure the 4Г-52 warhead in the warhead compartment, install the access door cover and tow the "КС" missile to the take-off position.

S E C T I O N II

"KC" MISSILE MAINTENANCE AFTER LANDING

(Supplement to Section IX, Book 1)

1. GENERAL

Perform the after-flight inspection of the missile after the TU-16KC carrier-aircraft lands with the "KC" missile attached.

Prior to the after-flight inspection proceed as follows:

1. Disconnect the cables from the K-403A fuses triggering pins, take off the fuses from the 4T-52 warhead and install instead of them wooden plugs according to the "4T-52 Warhead Description and Operating Instructions", "K-403 Fuse Operating Instructions", "Instructions for Preparation and Installation of the 4T-52 Warhead and K-403A Fuses in the "KC" Missile Warhead Compartment".

2. The "KC" missile must be detached from the TU-16KC carrier-aircraft rack by the ground servicing team according to the "Instructions for the TU-16KC carrier-aircraft auxiliary equipment maintenance".

3. Tow the "KC" missile to the loading site to remove the warhead.

The required equipment and instructions for removing the 4T-52 warhead are given in the "4T-52 Warhead Description and Operating Instructions", "Instructions for Preparation and Installation of the 4T-52KC Warhead and K-403A Fuses in the "KC" Missile Warhead Compartment".

Attachment No. 5 to

S E C T I O N III.

OPERATION AND MAINTENANCE OF THE ELECTRICAL AND SPECIAL EQUIPMENT

(Supplement to Section VII, Book I)

I. CHECKING THE ELECTRICAL AND SPECIAL EQUIPMENT ENERGIZED

Check the electrical and special equipment energized in two stages:

1. When the engine is inoperative and

2. when the engine is ground tested.

Check the equipment according to the diagram given in Fig.3 using the CT-5K battery cart furnished with the cable for connection to the "KC" missile.

To obtain the normal temperature condition required for operation of the K1-6M unit of the K1-M station during ground test of the "KC" missile, blow the K1-6M unit with air.

To do this, install the brackets with the fans (Fig.7) in the nose section of the "KC" missile on the left and right of the K1-O unit, before testing the K1-M station.

Install the fans as follows:

1. Unscrew two bolts (1) attaching the section with the dampers (2) and remove the section.

2. Install in the "KC" missile compartment the KC-7106--1121 bracket (3) and KC-7106-1122(4) bracket with the fans (5) attached to them.

3. Install the removed section with the dampers (2) in place and secure with bolts (1).

4. Unscrew 4 bolts (6) attaching the dampers (7 and 8) and secure the brackets (3 and 4) together with the dampers (7 and 8) by the bolts (6).

5. Tie the cables on the left side to the section (2) using the tape with the button (9). Check that the clearance between the fan blades (when rotating) and cables and waveguides is 5 mm.

6. Connect the KC-7106-1103 cable plug connectors to the fan plug connectors.

7. Before energizing the K1-M station, connect the other end of the cable to 27 V D.C. power supply source.

Remove the brackets with the fans reversing the installation procedure.

I. CHECKING WITH THE ENGINE INOPERATIVE

Check the electrical equipment energized with the engine inoperative prior to the monitoring tests of the engine.

With the engine inoperative, the following energized circuits of the missile electrical system must be checked:

1. СД-3 oil pressure switch circuit
2. "КС" energized signal circuit
3. K1-M station power supply circuit
4. АПК-5В autopilot power supply circuit
5. "RELEASE" command circuit
6. Engine starting units circuit (СД65АНМ plugs, СП-45 starting fuel nozzles, КР-1 booster coil

7. Tracer circuit

8. УТ-6М electric actuator power supply and warning system circuit

9. МЗК-2-2 electric actuator power supply and warning system circuit.

PREPARATION OF THE "KC" MISSILE FOR CHECKING

10. Check the CT-5K cart battery voltage by setting the "VOLTAGE" selector switch in the "BATTERY" position. The voltage of the battery loaded must be not less than 24 V.

11. Remove the covers of the fuselage lower access doors between frames 5-6, 11-14, 14-18, starboard access door between frames 16-18 open the "ENGINE STARTING UNITS" access doors on the fuselage portside and starboard. Remove the clamps from the control surfaces.

12. Disconnect the electrical cable plug from the НВ-2 pump, set the "POWER" switch on the [illegible]-I control unit of the АПК-5В autopilot and the "STATION", "RESONATOR", "ANTENNA" switches on the К1-12М unit of the К1-М station in the "OFF" position. On the CT-5K battery cart control panel set the "EXTERNAL POWER","LOADING" switches and the "IGNITION", "STARTING PANEL" circuit breakers in the "OFF" position and the "CURRENT", "VOLTAGE" selector switches in the "BATTERY" position.

The cut-off valve and throttle valve selector switches must be set in the centre position and the "COMMAND" switch in the "COMMAND" position.

13. Connect the connecting cable to the РР-63 receptacle of the "KC" missile to the [illegible] and 4-pin receptacle

of the CT-5K battery cart.

WARNING: When further operating on the CT-5K cart control panel, see that the "STARTING PANEL" and "IGNITION" switches are in the "OFF" position and the "COMMAND" switch in the "COMMAND" position.

CHECKING THE CIRCUITS OF THE GM-3 PRESSURE SWITCH POWER SUPPLY AND THE "KC" ENERGIZED SIGNAL

14. Connect the plug with the "MISSILE ENERGIZED" warning light built in it (the connector plug is furnished with the set of the CT-5K cart) to the MP48Ш2663Ш2 cable connector receptacle (pins).

15. Set the "EXTERNAL POWER" selector switch on the cart control panel in the "ON" position. In this case the "NO OIL PRESSURE" warning light on the cart control panel and the "MISSILE ENERGIZED" warning light at the MP48Ш2663Ш2 cable plug connector should come on. When further supplying electric power to the "KC" missile bus bar, the "NO OIL PRESSURE" warning light should always come on.

16. Set the "EXTERNAL POWER" selector switch in the "OFF" position and disconnect the plug with the warning light from the MP48Ш2663Ш2 receptacle.

CHECKING THE K1-M STATION POWER SUPPLY CIRCUITS

17. Set the "EXTERNAL POWER" selector switch on the battery cart control panel in the "ON" position.

18. Set the "ANTENNA" and "STATION" switches on the K1-12M unit in the "ON" position. In this case the "A-250" and "A-500" inverters should start operating and the K1-7M unit radiator should begin rotating.

Check the inverters and K1-7M unit operation by a characteristic noise. The test duration must be not more than 3.5min.

WARNING: When checking, install and connect the K1-12M and K1-7M units and K1-0 cradle with units. If the above units are not installed, switch on the station for not more than 1-2 sec.

19. Switch off the K1-M station by setting the "ANTENNA" and "STATION" switches on the K1-12M unit in the "OFF" position.

NOTE: Check the K1-M station power supply circuits in the presence of the person responsible for servicing the station.

CHECKING THE АПК-5В AUTOPILOT POWER SUPPLY CIRCUITS

20. Set the "POWER" switch on the П-1 control unit in the "ON" position; in this case the ПАГ-12А inverter and gyro in the П-2 gyro unit should start operating.

Check the inverters and gyros operation by a characteristic noise.

21. Set the "POWER" switch on the П-1 unit in the "OFF" position.

Duration of the check, according to step 20, must be not more than 1-1.5 minutes.

NOTE: a) When checking the AMK-5B autopilot supply circuit with the P-2 unit removed, check the circuits serviceability by illumination of the "AUTOPILOT POWER SUPPLY" warning light connected to the plug connector (46) receptacle (the connector plug with the warning light built in it is furnished with the set of the CT-5K battery cart) instead of switching on the inverters and gyros. In this case, switching on and off the power supply is performed by the "EXTERNAL POWER" selector switch on the CT-5K battery cart control panel instead of the "POWER" switch on the P-1 unit.

b) Check the AMK-5B autopilot power supply circuits in the presence of the person responsible for servicing the autopilot.

CHECKING THE "RELEASE" COMMAND CIRCUIT

22. Make sure that the "COMMAND" switch on the CT-5K battery cart control panel is set in the "COMMAND" position.

23. Remove the cover plug from the "K" plug connector for the board check. (Cable plug (13) between frames No.3-6, port-side) and connect the connector plug with the "COMMAND" warning light built in it (the connector plug is furnished with the set of the CT-5K cart).

panel

24. Set the "COMMAND" switch on the battery cart in the "OFF" position. In this case the PT-40 relay on the missile board is de-energized and closes its contacts; the "COMMAND" warning light should come on.

The K1-6M unit time mechanism electric motor may start rotating (the motor rotation is determined by a characteristic noise).

25. After setting the "COMMAND" switch in the "OFF" position the BSCOC-45 tail light must come on.

CAUTION: Check the tail light for switching on for not more than 1 mm.

26. Set the "COMMAND" switch on the battery cart control panel in the "COMMAND" position, the "COMMAND" warning light must go out, the K1-6M unit time mechanism electric motor must stop operating and the BSCOC-45 tail light must go out.

27. Disconnect the connector plug with the warning light from the "K" plug connector for the board check and close it with a cap.

CHECKING THE ENGINE STARTING UNITS AND TRACER POWER SUPPLY CIRCUITS

28. Remove the insulation sleeve from the tracer positive and negative wires lugs, interconnect the wires and, pressing the "TRACER" button on the CT-9K battery cart control panel, make sure that the circuit is serviceable; the continuity of the circuit is indicated by illumination of the light located near the button.

29. Disconnect the power positive and negative wires, insulate and fasten them. Set the "EXTERNAL POWER" switch in the "OFF" position.

32. Disconnect the high tension wires from the igniter plugs and place the wires so that a gap between the wire contact spring and the missile structure would be 3-4 mm.

33. Set the "IGNITION" switch on the CT-5K battery cart control panel in the "ON" position; press momentarily the "IGNITION CHECK" button and make sure that a spark between the contact spring and the missile structure appears.

34. Place the high tension wires so as to obtain a gap of not less than 40 mm. between the wire contact spring and the missile structure; check the SM-45 starting fuel nozzle solenoid valves for serviceability by pressing the "IGNITION CHECK" button for 3-5 sec. The starting fuel nozzles operation is indicated by a charabteristic click heard at the instant of pressing the button.

NOTE: Test the engine starting units circuits outside the hangar before testing the PD-500K engine.

35. Set the "IGNITION" switch on the battery cart control panel in the "OFF" position and connect the high tension wires to the igniter plugs.

CHECKING THE MEK-2-2c AND VT-6A ELECTRIC ACTUATORS POWER SUPPLY AND SIGNAL CIRCUITS

36. Move the MEK-2-2c electric actuator control selector switch on the CT-5K battery cart control panel to the "CUT-OFF VALVE OPEN" position. After the electric actuator motor has

completed its operating cycle, the "CUT-OFF VALVE OPEN" warning light must come on.

37. Perform the above procedure with the switch moved to the "CUT-OFF VALVE CLOSED" position.

38. Move the YT-GI electric actuator control selector switch to the "HIGH SPEED" position.

After the electric actuator motor has completed its operating cycle, the "HIGH SPEED" warning light must come on.

39. Perform the above procedure with the selector switch moved to the "LOW SPEED" position.

The time required for the throttle valve rod to move from one extreme position to the other must be within the limit of 10-20 sec.

WARNING: After the above mentioned test is accomplished, check that the cut-off valve is closed and the throttle valve is in the "LOW SPEED" position.

OPERATIONS PERFORMED AFTER ACCOMPLISHING THE CHECKS

40. Make sure that all the switches and selector switches on the battery cart control panel are set in the positions indicated in step 12, this paragraph.

41. Check the missile compartments for freedom from foreign objects, connect and secure the THB-2 pump plug connector which is disconnected during the check.

NOTE: If it is necessary to detect broken wires, poor contact and other defects, test the electric and special equipment circuits for continuity by ringing them out. Ring out the circuits consulting the wiring diagrams furnished with the set of documents 1:20.

2. CHECKING DURING THE ENGINE TEST

Before starting the engine, check the NR-2 pump operation by a characteristic noise.

Check the CT-500K starter for serviceability according to the engine turbine acceleration during the engine cold rotation. The starter must accelerate the turbine up to 1100-1300 r.p.m. indicated by the tachometer on the CT-5K battery cart control panel.

When testing the engine, check the generator with the relay-regulator unit for proper functioning as outlined below.

CHECKING THE OPERATION OF THE ГСН-3000М GENERATOR, АМР-400А RELAY AND Р-25АМ VOLTAGE REGULATOR

Check the operation of the generator in conjunction with the relay and regulator during the engine run. When the engine gains a speed of 5500-6500 r.p.m. the generator must be connected to the electrical system which is indicated by illumination of the "GENERATOR ON" warning light on the CT-5K battery cart control panel.

WARNING: When the "GENERATOR ON" warning light becomes illuminated, set the "EXTERNAL POWER" selector switch in the "OFF" position.

With the engine speed corresponding to the thrust of 1310±25 kg. check the operation of the generator and P-25 AM voltage regulator under load; to do this:

1. Switch on the generator full load equivalent(simulator) by setting the "LOAD" switch on the CT-5K battery cart control panel in the "ON" position.

2. Check voltage and current indicated by the instruments on the cart control panel by setting the "VOLTAGE" and "CURRENT" selector switches in the "GENERATOR" position.

The circuit voltage must be 28±0.5 V, current - 100^{+20} A.

NOTE: If the voltage is off the above limits, adjust it by means of the rheostat installed in the P-25 regulator unit.

3. Unload the generator by setting the "LOAD" switch in the "OFF" position.

WARNING: a) The generator must be loaded for not more than 2 min.

b) With decrease in the engine speed to 80 r.p.m. set the "EXT. POWER" selector switch in the "ON" position.

2. ADJUSTING THE K1-7M ANTENNA

1. GENERAL

1. Adjust the K1-7M antenna when replacing the antenna or polystyrol nose cap.

2. The K1-7M antenna in the "KC" missile is electrically adjusted to set the antenna electrical axis in the vertical plane 1°15'±5' down from the missile longitudinal axis.

Setting of the antenna axis in the horizontal plane parallel to the missile longitudinal axis to within 0°±5' is also performed electrically.

3. The K1-7M antenna must be adjusted in a special room, on the area free from objects and measuring not less than 14x6=84 square metres with the height (up to the roof, beams or ceiling) of not less than 4 m.

NOTE: 1) The space between the K1-7M antenna and a target simulator antenna must be free from foreign objects except the connecting high-frequency cable.

2) The "KC" must be positioned on the area so that the rear end of the fuselage would be at the area edge.

3) If there are no precipitations or wind, the antenna is permitted to be adjusted in the open air.

2. TEST EQUIPMENT AND DEVICES USED DURING THE ANTENNA ADJUSTMENT

When adjusting the K1-7M antenna, the following test equipment and devices are used:

1. Set of the K-100M test equipment.

2. Jacks, any type, which ensure rigid setting of the "KC" missile and adjustment of its position in the vertical and horizontal planes.

3. HB-1 levelling instrument.

4. Datum levelling bar with the level and division value of 1 mm.

5. Device for pulling up a string above the "KC" missile.

6. Tape-line, not less than 3 m. long.

7. Portable lamp.

8. Special triangle with the level for installing the K1-7M antenna reflector.

3. LIST OF DOCUMENTS REQUIRED FOR THE K1-7M ANTENNA ADJUSTMENT

1. Rigging diagram of the "KC" missile on which the K1-7M antenna is adjusted.

2. Technical documents certifying that the test equipment and devices used during adjustment are serviceable.

3. The given instructions.

4. Temporary operating instructions for the K1-M station.

5. Temporary operating instructions for the K-100M test equipment.

4. PREPARATORY OPERATIONS

1. Using the levelling instrument, datum levelling bar with the level, string with a plumb and jacks, set the "KC" missile in the level flight position according to the instructions given in the "[redacted] Instructions. Book 1. [redacted]

2. Remove the nose cap. Set the K1-7M antenna so that the parabolic reflector edge would be in the vertical plane.

To do this, using the plumb and special triangle set the K1-7M antenna in the required position by rotating the antenna adjusting screws.

The plumb thread and the parabolic reflector edge plane

may be unparallel for not more than ±0.5 mm. at a distance of 360 mm.

When performing this operation obtain the clearance of 0.5-1 mm. between the plane of the attachment ring and antenna--to-ring lower attachment fitting.

NOTE: 1. The clearance between the K1-7M antenna upper attachment fittings and the attachment ring plane may differ from the clearance between the K1-7M antenna lower attachment fitting and the attachment ring plane due to a production tolerance for the attachment ring installation.

2. When setting the reflector edge in the vertical plane, the plumb thread must be as closer as possible to the parabolic reflector edge plane (but does not contact it).

3. Using the string with the plumbs align the antenna simulator line of symmetry with the "KC" missile plane of symmetry.

4. Install the target simulator antenna at the height of the K1-7M antenna radiator centre of rotation; for this purpose switch on the K1-M station for 4-5 sec. Mark on the edge of the K1-7M antenna rotating radiator the motionless point - center of rotation - by means of a sharply pointed pen. Switch off the K1-M station.

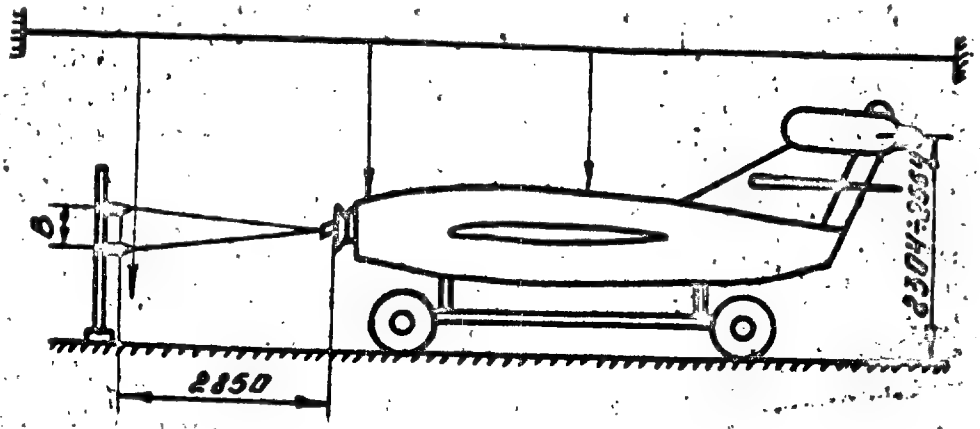
Using the levelling instrument and datum levelling bar, measure the height of the K1-7M antenna radiator axis of rotation and set the target simulator antenna line of symmetry at the same height.

NOTE: When measuring the height of the target simulator antenna line of symmetry place the side pin of the datum levelling bar to the side of the datum point marked on the cylindrical (metal) part of the target simulator antenna.

5. Using the tape-line place the target simulator antenna at a distance of 2850±10 mm. from the K1-7M antenna.

NOTE: Measure the distance of 2850 mm. from the vertical plane passing through the K1-7M antenna parabolic reflector edge to the beginning of the target simulator antenna cylindrical part.

To find the centre of the circle place the datum levelling bar on the reflector edge.



Move the target simulator antenna in the vertical plane by the value B where B=2850, tangent $1^{\circ}15' = 2850 \times 0.02182 = 62.5$ m. After the "KC" missile and test equipment are prepared for operation set:

1) Operating frequency of the Yi-MM generator equal to "E"

2) K1-M station operating mode - KAFC

3) Power of a signal on side "A", exceeding 3-4 db, the KAFC threshhold stopping.

4) Percentage modulation of a signal on side "A" equal to m=0%.

5) Power of a signal on side "B" equal to 40-50 db.

6) Yi-MM generator starting pulse delay equal to 80-100 microsec.

5. ADJUSTMENT PROCEDURE

1. Switch on the K1-M station and make sure that it is serviceable by reading the instruments on the test control panel.

2. Check the control voltages for no out-of-balancing in the direction and pitch channels. If the control voltages are out of balance, balance the voltages using the "Balance Y" and "Balance Z" potentiometers of the K1-6M unit.

NOTE: 1. To measure the control voltages more accurately use the M-91 instrument connected to the "CV" (control voltage) sockets of the test control panel.

2. When being adjusted the K1-M station is loaded

with the AHK-5B autopilot included in the airborne set of the "KC" missile special equipment.

3. Adjust the K1-7M antenna attachment fittings so that the control voltages of the direction and pitch channels are equal to zero.

4. Install the K1-7M antenna nose cap on the "KC" missile and fasten it by two screws.

5. Measure the control voltages of the direction and pitch channels with the nose cap installed.

6. Remove the nose cap and adjust the K1-7M antenna position (by means of the attachment fittings) so that the control voltages of the direction and pitch channels are equal but opposite in sign to the control voltages obtained with the nose cap installed.

7. Install the nose cap and make sure the control voltages of the direction and pitch channels are zero.

NOTE: When taking zero readings of the control voltages permissible leaps of the measuring instrument pointer at the zero mark must be within ±0.2 V.

8. Switch off the station, remove the nose cap, secure the K1-7M antenna attachment fittings and install the nose cap again.

9. Switch on the station and make sure that with the nose cap installed and K1-7M antenna attachment fittings secured the control voltages are zero.

NOTE: After securing the K1-7M antenna attachment fittings the permissible control voltages of the direction and pitch channels should not exceed ±0.1 V.

10. If with the nose cap installed and K1-7M antenna attachment fittings secured the control voltages are present repeat the operations outlined in steps 6,7,8, this Section, till the required results are obtained.

11. Paint a red mark on the main and locking parts of the K1-7M antenna attachment fittings.

S E C T I O N IV

GROUND EQUIPMENT DESCRIPTION, PURPOSE AND OPERATING INSTRUCTIONS

(Supplement to Section X, para.2, Book I)

I. TRANSPORTING AND ATTACHING THE "KC" MISSILE TO THE CARRIER-AIRCRAFT

1. Transport the missile to the carrier-aircraft from the carrier-aircraft tail side.

2. When transporting the missile stop the tractor so that the distance from the carrier-aircraft wing would permit the tractor to turn and move backward.

3. Manually place the cart under the carrier-aircraft wing so that the "KC" missile attachment lugs would be under the shackle on the carrier-aircraft rack.

4. Using the carrier-aircraft winch lower the rack shackle and fasten it to the "KC" missile attachment lugs.

5. Unscrew the hold-down special bolts of the cart rear support and remove the quick release lock pin of the front support.

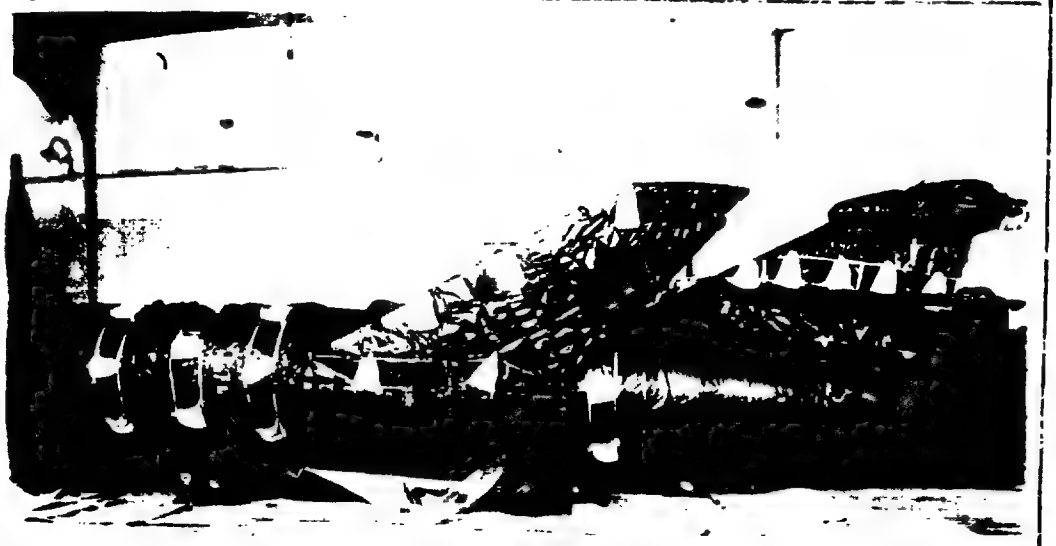
6. Lift the missile up to the carrier by means of the winch according to the "Maintenance Instructions for the TU-16KC Aircraft Auxiliary Equipment".

7. Remove the front support from the missile and install it on the cart. After that move the cart away from under the "KC" missile.

NOTE: The missile wings must be lowered when it is transported to the carrier-aircraft.

ILLUSTRATIONS

25X1



...Missile before being covered with
...film envelope.
...with silica gel.

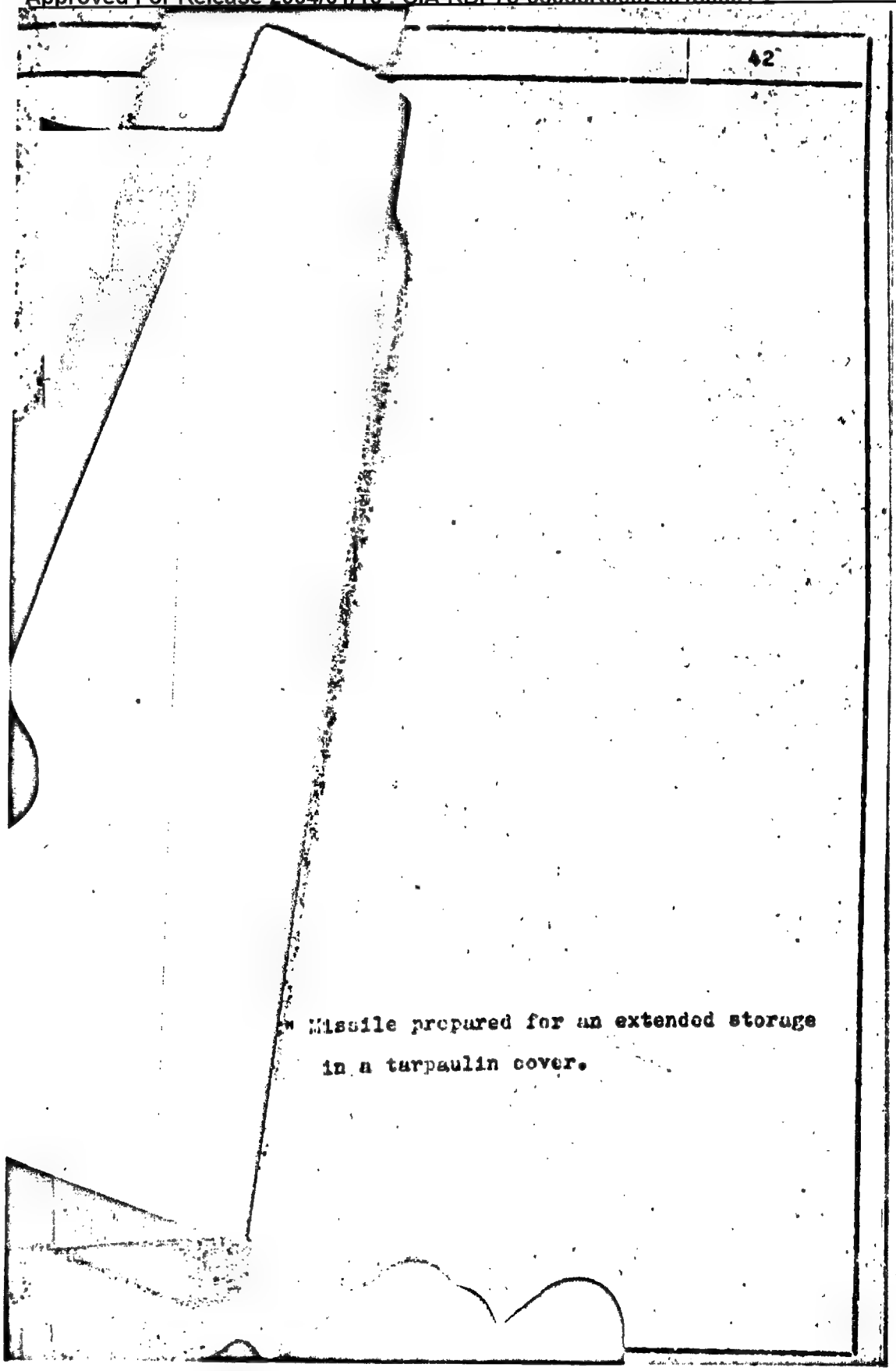
...before being covered with ... cover.

25X1

Attachment No. 10

42

Attachment No. 5 to



* Missile prepared for an extended storage in a tarpaulin cover.

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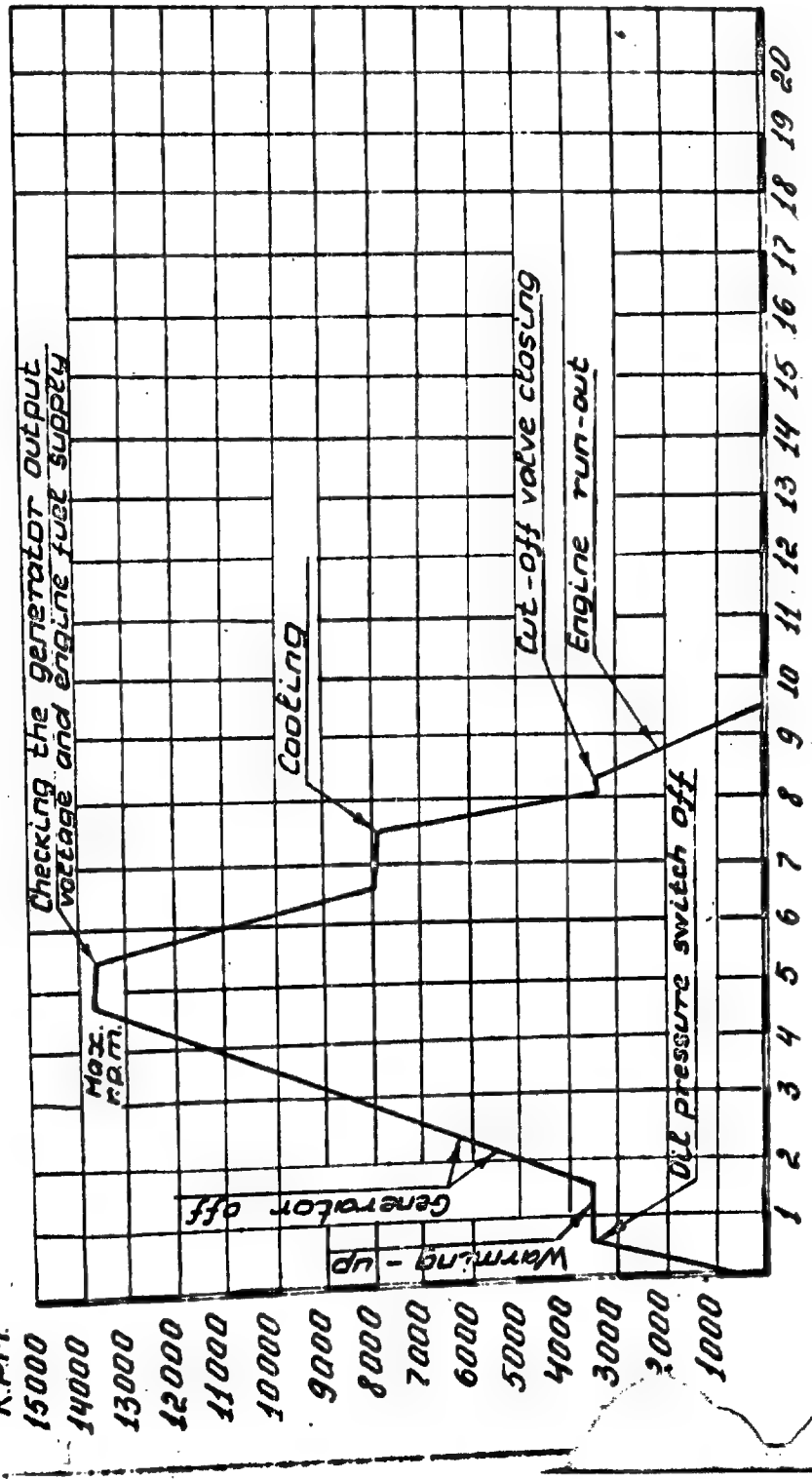

Fig.4. Missile engine test chart (from a carrier-aircraft).

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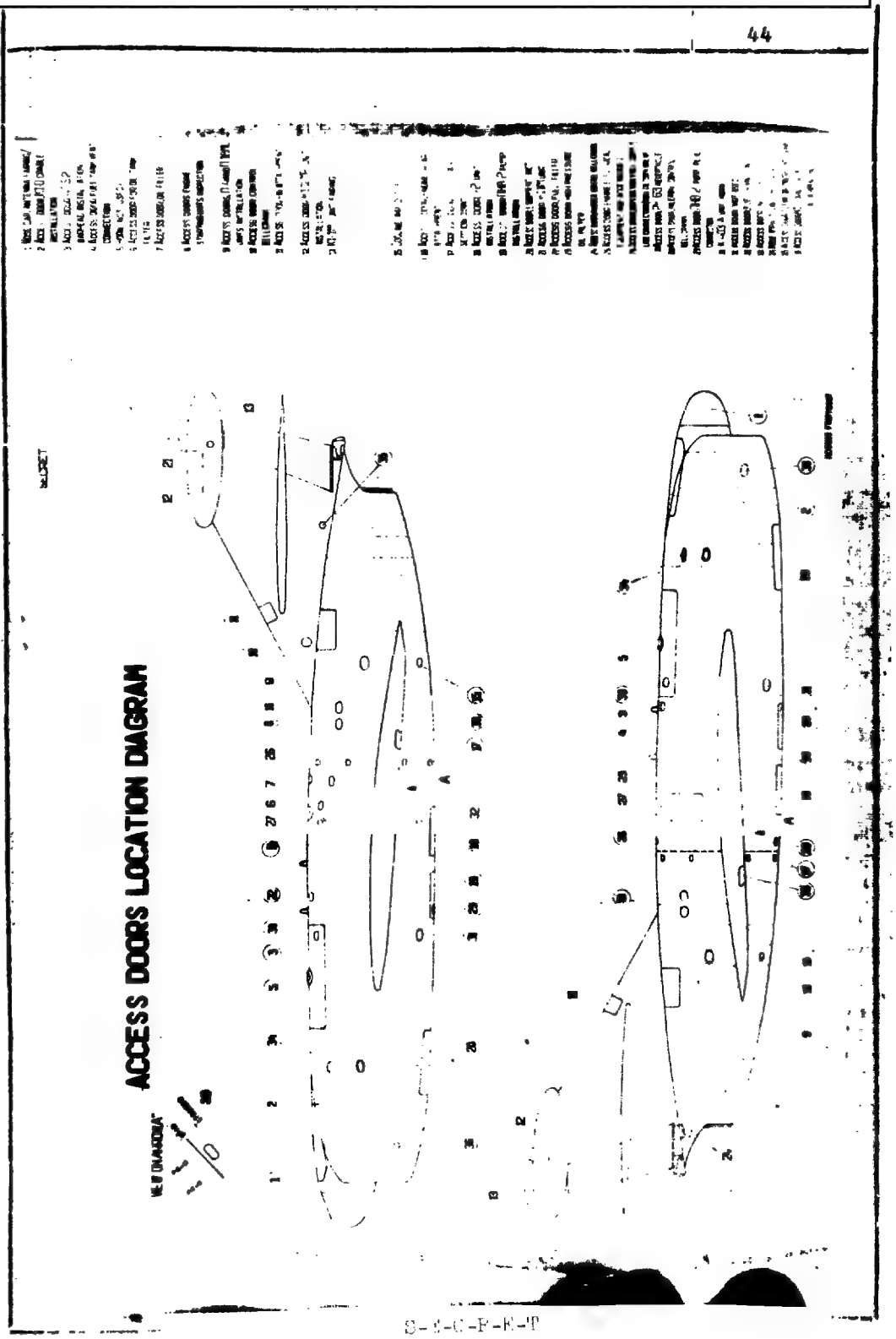

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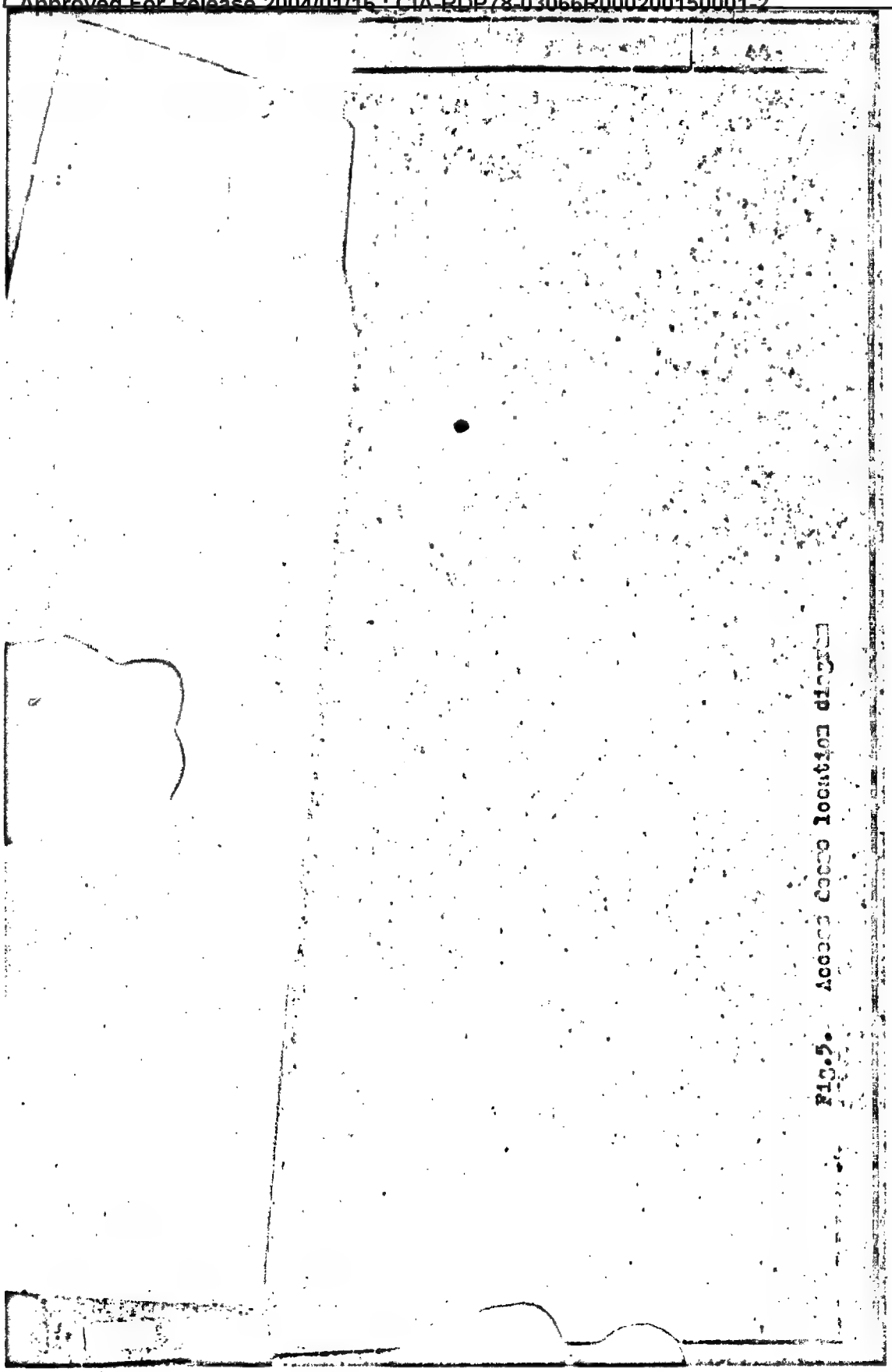

Fig 5. Access door location diagram

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Key to Fig.5.

1. Nose cap (antenna fairing);
2. Access door, K1-0 cradle installation;
3. Access door, AP-5Z warhead installation;
4. Access door, fuel tank vent pipe connection;
5. Horn (not used);
6. Access door, [illegible] oil tank filter;
7. Access door, oil filler;
8. Access doors, engine starting units inspection;
9. Access doors, K-[illegible] and K-1C 80 units installation;
10. Access door, control bellcrank;
11. Access door, fin attachment;
12. Access door, K1-12EP unit installation;
13. K1-1E unit fairing;
14.
15. Cooling air outlet;
16. Access door, engine rear attachment;
17. Access doors, fuselage section joint;
18. Access door, K-[illegible] unit installation;
19. Access door, NB-2 pump installation;
20. Access door, equipment installation;
21. Access door, K1-1E unit;
22. Access door, fuel filler;
23. Access door, high pressure oil filter;
24. Access door, rudder control bellcrank;
25. Access door, engine electrical equipment and accessories;
26. Access door, duplicating fuel supply line connection (non-return valve);
27. Access door, PK-63 receptacle;
28. Access door, aileron control bellcrank;
29. Access door, NB-3 pump plug connector;
30. K-403A unit horn;
31. Access door (not used);
32. Access door, fuel drain point;
33. Access door (not used);
34. Nose impact switch covers;
35. Access door, elevator control bellcrank;
36. Access door, K1-0 cradle rigid attachment bolts.

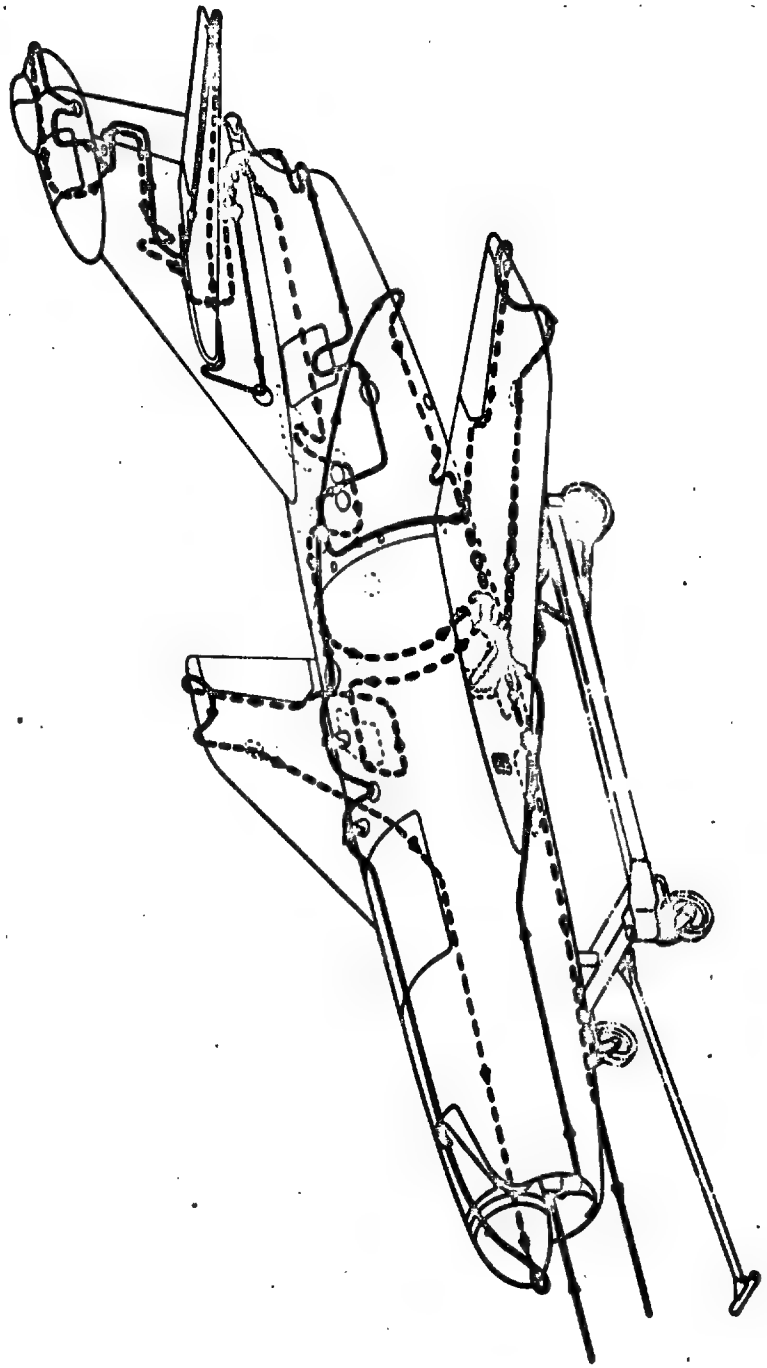

Fig.6. Exterior inspection circuit about the "KC" missile.

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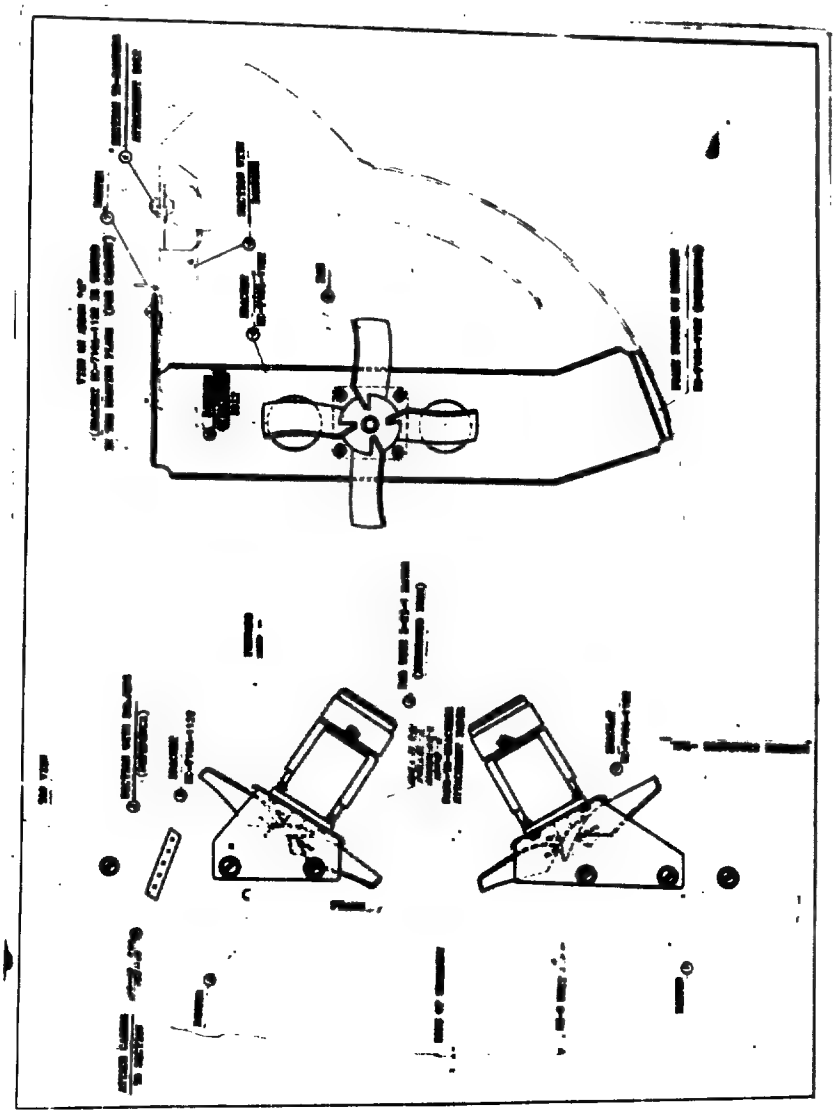

1.7. Installation of F-16 unit blowing fans during the "X" missile ground test procedure.

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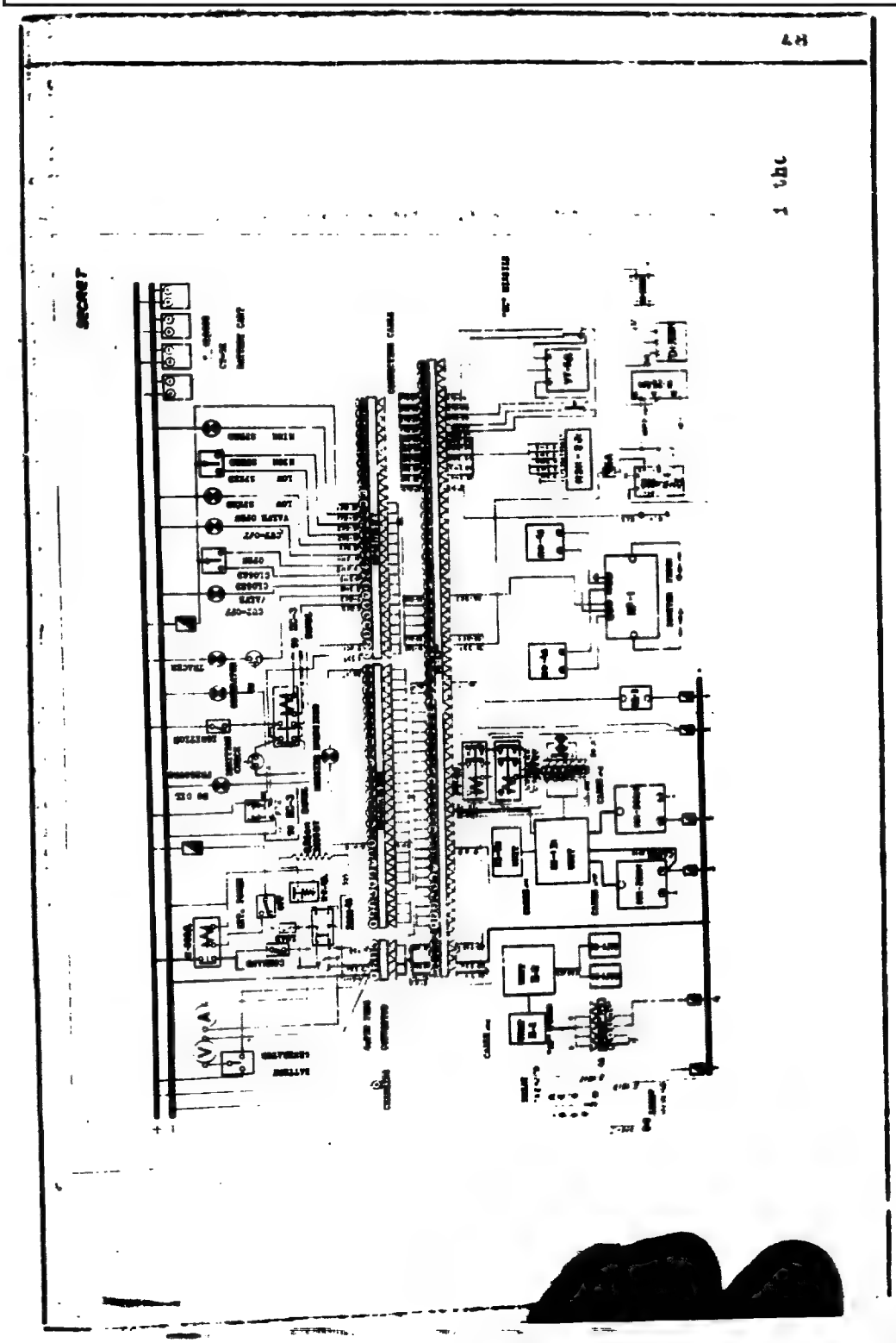

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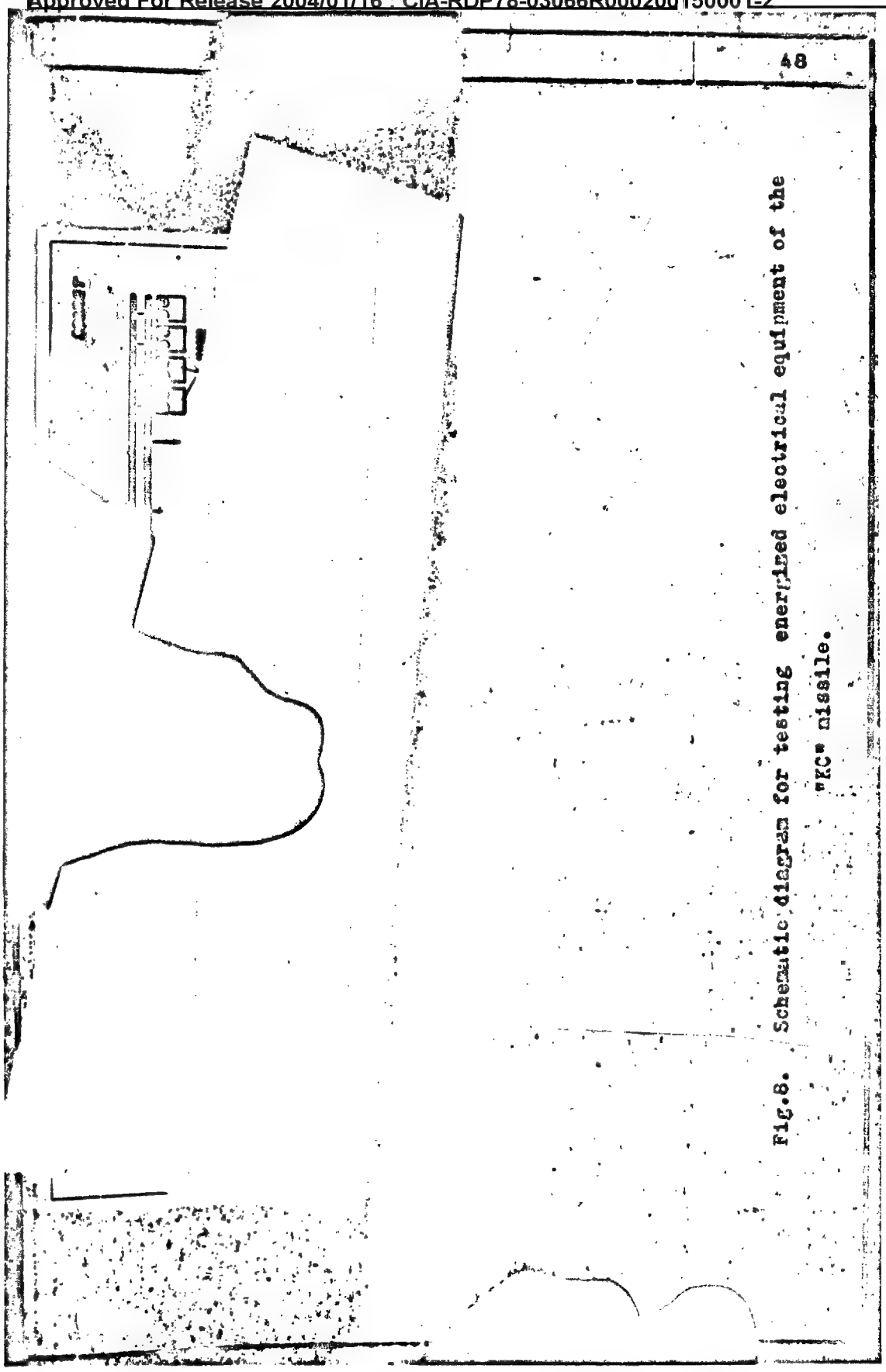

Fig.8. Schematic diagram for testing energized electrical equipment of the "KC" missile.

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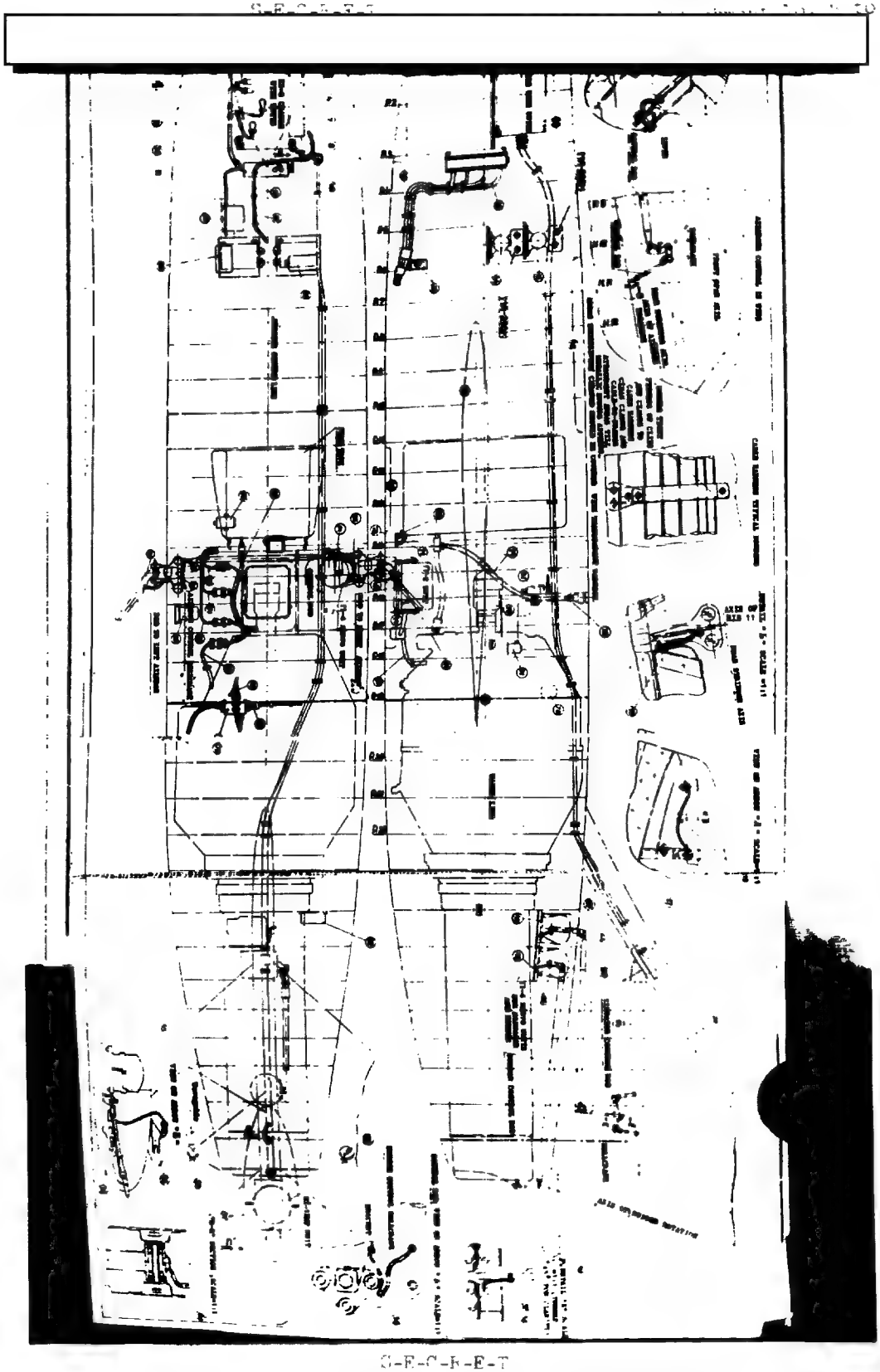

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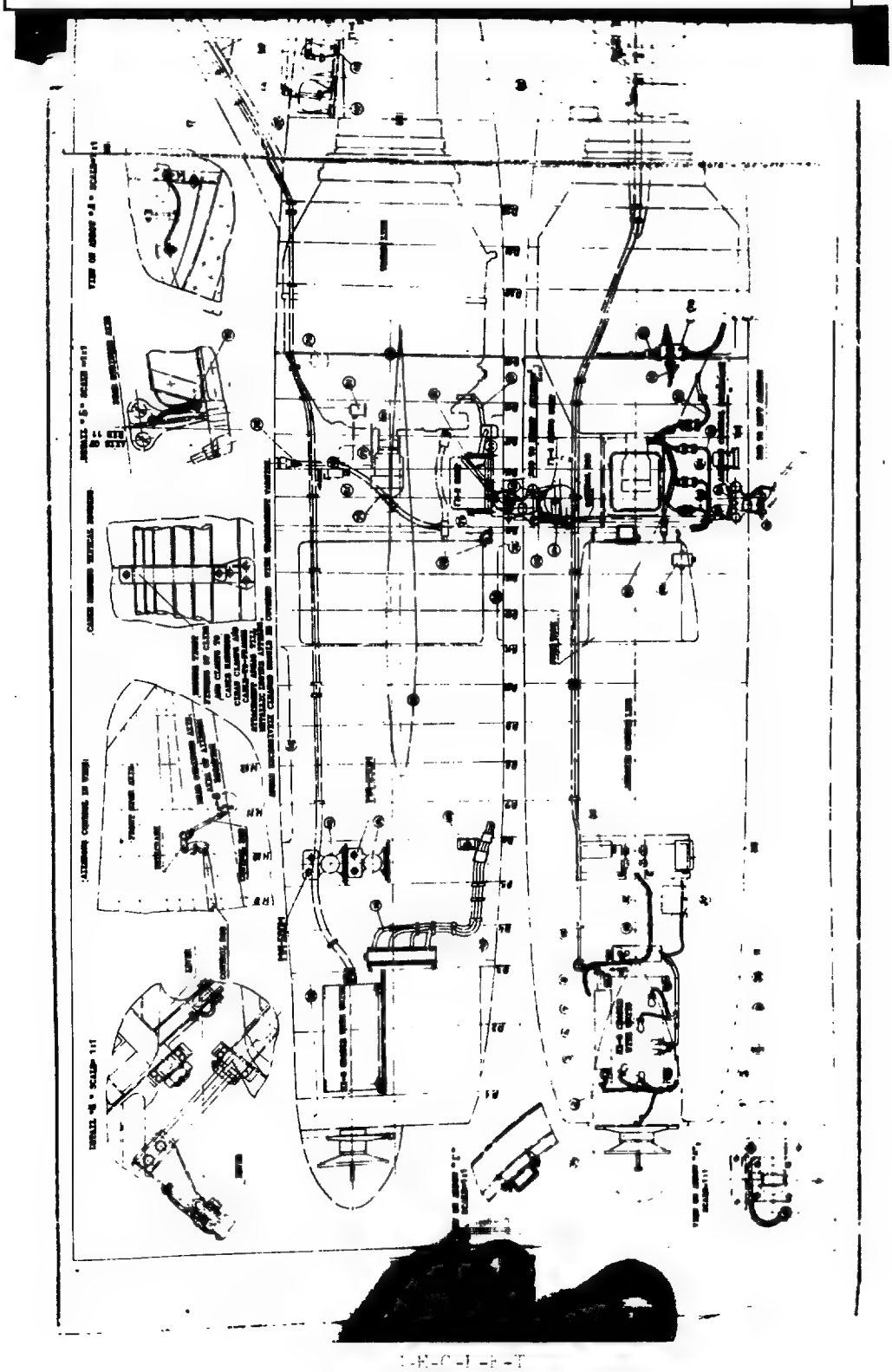


25X1

Transitional resistance not more than 600 microohm

1. KC-7000-00 cable No.1	-	body
2. KC-7000-00 cable No.2	-	body
3. KC-7000-00 cable No.3	-	body
4. KC-7000-00 cable No.4	-	body
5. KC-7000-00 cable No.5	-	body
6. KC-7000-00 cable No.6	-	body
7. KC-7000-00 cable No.7	-	body
8. KC-7000-00 cable No.8	-	body
9. KC-7000-00 cable No.9	-	body
10. KC-7000-00 cable No.11	-	body
11. KC-7000-00 cable No.13	-	body
12. KC-7000-00 cable No.17	-	body
13. KC-7000-00 cable No.18	-	body
14. KC-7000-00 cable No.15	-	body
15. KC-7106-300 MA-500M	-	body
16. KC7106-270 KI-13M	-	body
17. KC7000-00 cable 19/2	-	body
18. KC-7000-00 cable No.15/1	-	body
19. KC-7106-150 special wiring	-	body
20. KC7202-190 CG-3000P	-	body
21. KC7000-00 cable No.2	-	engine
22. KC-7000-00 cable No.1	-	body
23. KC-7000-00 cable No.3	-	body
24. KC-7000-00 cable No.5	-	body
25. KC-7000-00 cable No.6	-	body
26. KC-7000-00 cable No.8	-	body
27. KC7000-00 cable No.9	-	body
28. KC-7704-30 KIAI-13A	-	body
29. KC-7704-2000 KIAI-13A	-	body
30. KC7704-160 KI-1	-	body
31. KC7704-190 KI-2	-	body
32. KC-7704-710 KI-18M0	-	body
33. KC-7106-210 KI-0	-	body
34. KC-7106-390 KI-7M	-	body
35. KC-7106-420 KI-1M	-	body
36. KC-7106-420 KI-11	-	body
37. KC-7106-420 KI-12MP	-	body
38. KC-1800-00 wing	-	body
39. KC-0200-00 access dcoor cover	-	body

40.КС-0221-100	access door cover	- body
41.КС-0222-00	access doocr cover	- body
42.КС-0223- 00	access door cover	- body
43.КС-0227- 00	access door cover	- body
44.КС-0228-00	access door cover	- body
45.КС-3000-00	access door [illegible]	-upper fairing
47.КС-5102-20	ТИ-4 elevator	- body
48.КС-5102-20	ТИ-4 rudder	- body
49.КС-5101-00	ТИ-4 aileron	- body
50.КС-7202-180	Б-14А	- body
51.КС-6400-00	ДТ-6	- engine
52.КС-6400-00	extension pipe	- engine
53.КС-6400-00	engine	- body
54.КС-3000-00	stabilizer	- lower fin
55.КС-3000-00	upper fin	- lower fin
56.КС-7202-900	platform	-body
79.КС-7202-880	warning light ВБ СОС-45	- body
80.КС-7106-830	unit СД КС-1А	- body
81.КС-7202-700	box РТ-40	- body

Transitional resistance not more than 2000 microohm

57.КС-3200-00	shackle	- elevator
58.КС-3200-00	shackle	- elevator
59.КС-3000-00	rocker	- bracket
60.КС-5102-20	rocker	- lower fin
64.КС-5102-20	drive rod	- lever
65.КС-5102-20	drive rod	- lever
66.КС-5102-20	lever	- body
67.КС-5102-20	lever	- body
71.КС-6101-00	fual tank	- body
72.КС-6100-00	piping	- body
73.КС-6100-00	piping	- pipe
74.КС-6100-00	piping	-tank
75.КС-6100-00	piping	-aileron
76.КС-3500-00	shackle	-rocker
81.КС-5101-00	body	- rocker
82.КС-5101-00	drive rod	- rocker
83.КС-5101-00	drive rod	

84.KC-5101-00 drive rod - lever
85.KC-5101-00 drive rod - tip

Transitional resistance not more than 100 microohm

77.KC-6400-00 generator - engine
76.KC-7000-00 KJ-I -engine

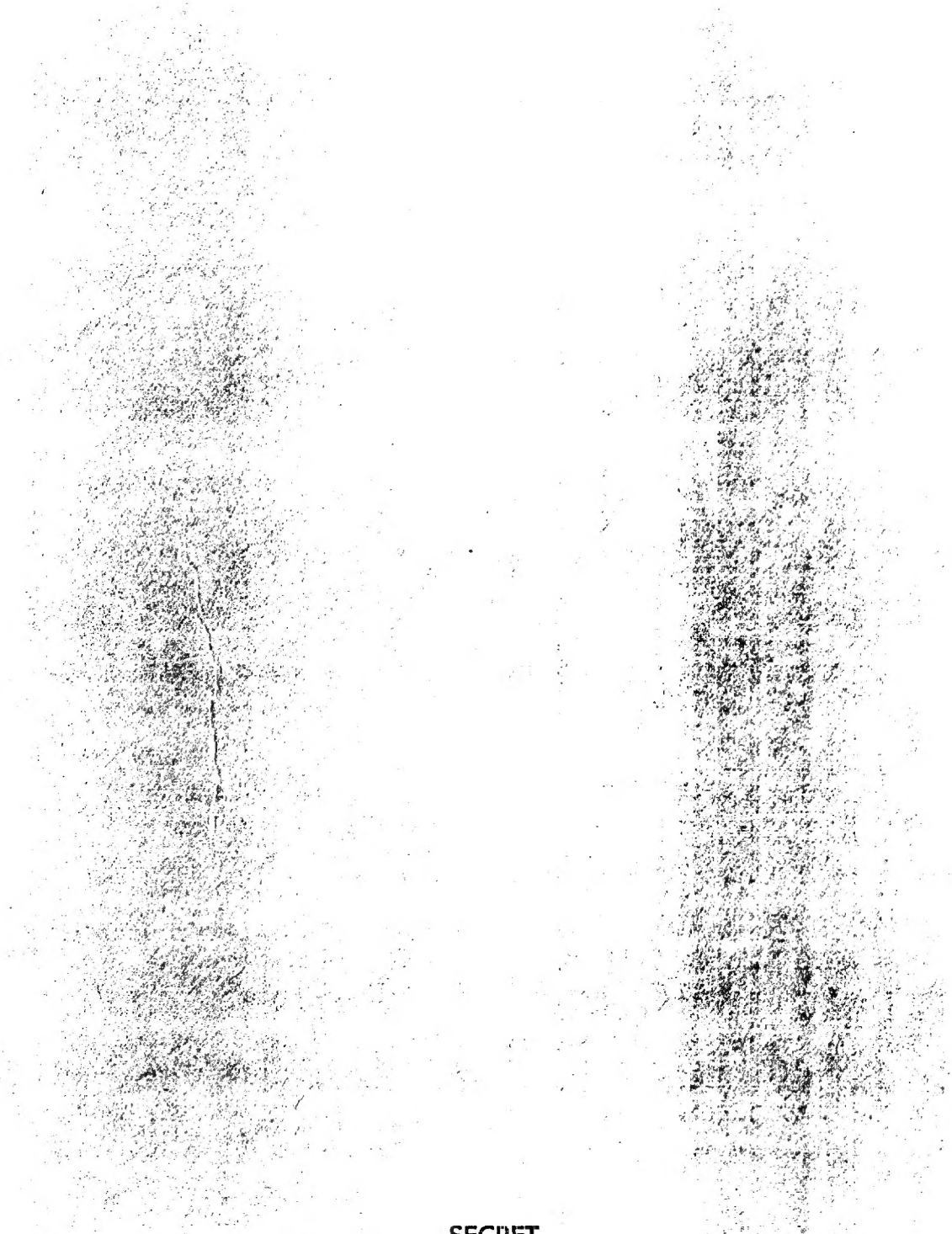
Attachment No. 5 to

Attachment No. 5

OPERATING INSTRUCTIONS FOR

THE ITEM KS

BOOK II



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